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GENTES HERBARUM

Quædam Palmæ Majorum Antillarum—II

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GENTES HERBARUM

Occasional Papers on the Kinds of Plants

By L. H. Bailey

Certain Palms of the Greater Antilles—II

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153. BUSHY CLUMP of ZOMBI PALM IN HAITI. *Zombia antillarum*. About five feet high. The lower leaf was injured by insects before it expanded, and the segments have fallen. Similar injury may be noted in the upper leaf; also in Fig. 158.

ARTICLE 16. NEW HAITIAN GENUS OF PALMS.

A strange palm grows on the hills of Haiti. It is a small fan-leaved species, notable for the slender segments of its foliage and the silvery sheen underneath. It sends up many shoots to make a clump like small canebrakes, and one or two trunks arise from them that grow to eight or nine feet tall, and every leaf-sheath is a loose sleeve of open-woven structure whose strands at the top make a formidable row of downward-pointing spines. The trunk dies before it attains great age and it may break off within the sleeves. Underneath the thin crown of foliage small white flowers are borne in short racemes, and in due time that season appears a cluster of brilliant white fruits as large as myrobalan plums.

This palm appears to be quite unlike any other. It received its current botanical name from Beccari in 1909. He knew it from collections in Berlin-Dahlem made by W. Buch. He described it as *Coccothrinax* (subgen. nov. *Oothrinax*) *anomala*. In 1937 it was my privilege to call on Mr. Buch, a German living long in Haiti, and I later found the palm near Gros-Morne, in the mountains of the northern part of the Republic. Ekman, the tireless Swedish collector, had found it here and elsewhere, and I have seen his specimens at Damien in Haiti; and Burret reported the collections in his Palmæ Cubenses et Domingenses a cl. E. L. Ekman in 1929. I obtained photographs of it in the wild, and botanical specimens. O. F. Cook had also taken it in this region in 1929.

The palm is introduced to the United States Plant Introduction Garden in southern Florida, and has now produced fruit, and through the courtesy of those in charge of that institution I have specimens and photographs.

To one who has seen this strange palm in its native place doubts at once arise as to its proper genus. It is evident that Beccari was in doubt inasmuch as he proposed the subgeneric name Oothrinax, a nomen probably suggested by the large egg-shaped fruit, although he had not seen the mature fleshy drupes but only certain dried parts. He further expressed his doubt in proposing the specific name *anomala*. Beccari's subgeneric name is a *nomen nudum* and therefore has no standing, although it is later somewhat but imperfectly described in English in Annals of the Calcutta Botanic Garden, 1931. If any person has employed it in a generic sense in general writing, that does not establish it; only a proper Latin diagnosis could validate it as a genus name.

One would think this odd palm must have attracted attention long before 1909, and so it turns out. Burret identifies it as *Palma dactylifera*,

radiata, minor, aculeata of Charles Plumier, the priest who so devotedly studied the Haitian flora and who published in 1703. Burret recognized it from one of Plumier's inedited drawings and from which he made a picture for his Ekman palms. The palm is also known to the natives in Haiti, by whom it is called *latanier zombi*, a name recorded in Barker & Dardeau, Flore d'Haiti. The word *latanier* is employed for fan-leaved palms, and *zombi* is the name of the dead who have come to life, the application to the palm being unknown to me. It would be preferable if this endemic palm could bear a Latin name indicative of its nativity rather than an exotic binomial of no relation with its country and the people.

It appears to have been overlooked that midway between Plumier and Beccari another writer had treated this palm and has left us a binomial for it. Perhaps this work may not be cited directly as taxonomic authority because it does not consistently adopt binomial nomenclature; but the binomial was taken up by Index Kewensis in 1895 and again in Index Londinensis in 1930. This work is by Descourtilz, Flore Pittoresque et Medicale des Antilles, second edition, volume 1, 1833, and the binomial is *Chamærops Antillarum*. The binomial has been officially approved as validly published.

Michael Etienne Descourtilz, 1775-1835, travelled extensively from France in Africa and the West Indies and wrote "Voyages d'un Naturaliste, et ses observations," in three volumes published in Paris, comprising accounts of animals and plants and other objects, with excellent illustrations, and in which he used binomial nomenclature in footnotes and elsewhere. As late as 1935 the part relating to his travels in Haiti, 1799-1803, was republished in Paris. In his "Flore Pittoresque" he gives a long account of *latanier épineux* ou *hache*, the spinous or armed fan-palm, of which the Latin name was stated as *Chamærops Antillarum*. His picture somewhat resembles that of Plumier as reproduced for Burret, although there is no indication in the text that he had seen the Plumier portrait of it. He cites Plumier's Latin name, as does Burret. Apparently his observations on the plant are original. He was particularly interested in the medicinal and other uses of the palm.

154. Flower of *Zombia antillarum* (×4).

The nomenclature of this Haitian palm works itself out as follows:

† **ZOMBIA,** gen. nov. Thrinacearum.

Flores hermaphroditi, albi, sessiles, in parvis sed gracilibus spadicibus interfoliaribus cum brevibus ramis lateralibus; spathæ siccæ angustæ appressæ vaginæ vel bracteæ: flos ad anthesim circa 5 mm. longus; stamina probabiliter 12, fixa prope basim in brevissimis filamentis; antheræ primo erectæ, bis excedentes, simplex

155. THE ZOMBI PALM, as it grows in the wild in Haiti. *Zombia antillarum*.

pistillum conicum, denique explicantes deflexæque pistillo tum amplificato; perianthium minutum, non tubulare, partibus eius acutis bracteis ad basim similibus: fructus albus, 19-22 mm. diam. brevi-oblongus, exocarpium album, glabrum, apice depresso; exocarpium siccum, tenue firmumque, brevi-oblongum, 12-15 mm. longum; semen brevi-oblongum, 8-10 mm. longum, liberum, rugosum, venosum, plus vel minus fissum vel bilobatum cum siccum, conspicuo columnari pariete intruso centrali. Arbor palmatifrondata, sobolifera; vaginæ frondis reticulatæ, apex spinis longis rigidisque. A Coccothrinace differt tuba perianthi obsoleta, staminibus elongatis pluribus quam 6, maximo fructu drupaceo, semine bilobato cum cavo centrali intruso et superficie venosa, albumine in lobis non ruminato, vaginis frondis tubularibus et longo-spinatis in apice, planta sobolifera vel cæspitosa.

† **Zombia antillarum,** trans. nov. Zombi Palm. Figs. 153, 154, 155, 156, 157.

Chamærops Antillarum, Desc. ex Jackson in Index Kewensis, i, 505 (1895).

Coccothrinax anomala, Becc. in Fedde, Repert. vi, 95 (1908); in Ann. Roy. Bot. Gard. Calcutta, xiii, 343 t. 31, v (1931); Burret, in Palmæ Cubenses et Domingenses a cl. E. L. Ekman, 17, t. 6, in Kungl. Svensk. Vetensk. Akad. Handl. ser. iii, vi (1929).

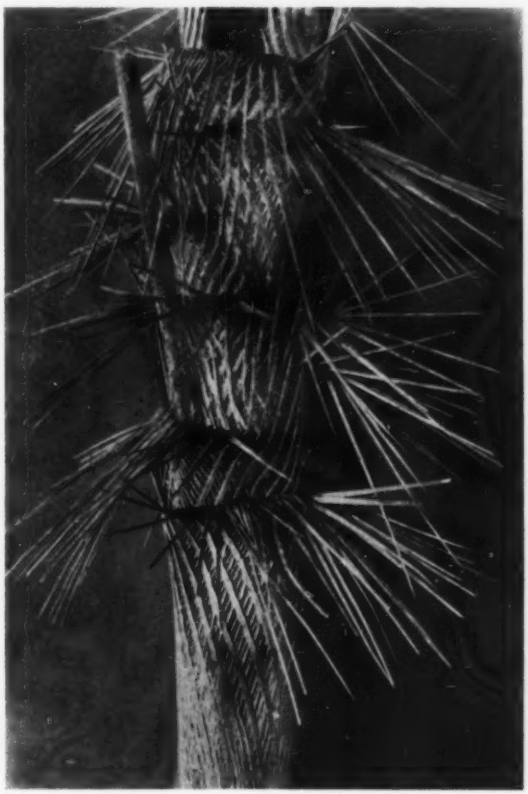
Palma pluribus truncis vel turionibus seriatim, circa 3 m. altis, 4-5 cm. diam.; frondi vaginæ reticulatæ et tubulares, spinis in apice 8-10 cm. longis; folia palmata, subter argentea, segmenta multa, 5 cm. vel minus lata, prope usque ad basim divisa, apices breviter bilobati; spadix interfoliaris, minus quam 1 m. longus, rami brevissimi; spathillæ tubulares, appressæ ad axim, 10-25 cm. longæ, apex acutus neque foliaceus neque elongatus.

Palm making a dense clump of slender shoots from the ground like young stools of bamboo, as well as slender trunks to about 3 m. tall and 5 cm. or less in thickness; small thin pneumatophores arise through the ground: leaves soon shedding from bole so that foliage may be only near the top and dead spadices may be hanging from sterile axils far below the crown; sheath of petiole much expanded and completely encircling the bole, consisting of many strong flat smooth strands of warp held together on the under side by close woof, the strands projecting at the top into stiff spines 8-10 cm. long (Fig. 156), the investiture becoming straw-colored, the succeeding layers of spines more or less spiral on the trunk in accordance with the phyllotaxy: leaves fan-shaped, rather thin, silvery on under surface and dull above, full grown blades 50-60 cm. long and 80 or 90 cm. broad, cut one-half to two-thirds to the base into 30-40 segments (segments from younger leaves much fewer and separated nearly to base) that taper either to long slender somewhat bifurcate points or to a broader end with flaring big notch, middle ones 5 cm. broad but outer ones very narrow, the narrower ones with strong central rib and broader ones with 3 or 4 main ribs and mostly lesser ones between, petiole 1 m. less or more long and 1 cm. or less broad, convex on both surfaces but thin-edged, hastula small, with projecting part at middle: spadices interfoliar but perhaps soon appearing infrafoliar from dropping of leaves, spreading, about 3-4 dm. long,

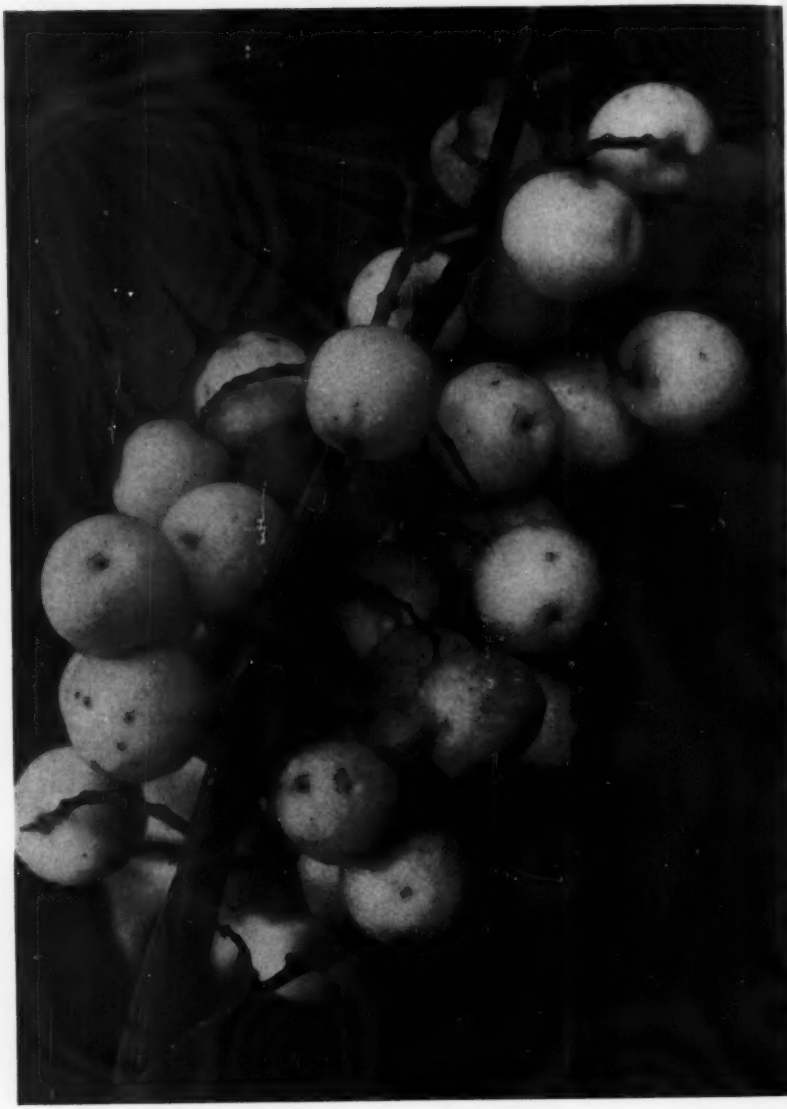
bearing simply branched short laterals from tubular acute not prolonged spathelets: flowers small, sessile, wide apart, about 5 mm. long at maturity, white (stramineous when dried); perianth of scarious points without tube about one-fourth length of large pistil; stamens more than 6, probably 12, on very short filaments, the long anthers covering the pistil at first but spreading at maturity (Fig. 154); pistil single, erect, 3-4 mm. long, conical and tapering to large hollowed stigma: fruit a brilliant white drupe (Fig. 157), 19-22 mm. in cross diameter, globular-oblong, apex sunken, flesh thin but soft and soon drying and becoming a thin dry oblong or nearly globular shell 12-15 mm. long and bearing at apex the stub of the persistent style and stigma and minute tubercles; seed free, broad-oblong, 8-10 mm. long, bilobate nearly to middle or below, surface irregularly creased and veined, provided with a central columnar intrusion but albumen of the parts or sections not ruminate.

High or dry lands, Haiti: near Port de Paix, Nord-Ouest, in valley of Trois-Rivières; near Gros-Morne, northern part of Artibonite; Miragoâne, eastern Sud, in Massif de la Hotte; *Buch*, *Ekman*, *Cook*, *Bailey*.

I do not know of pictures having been printed of the zombi palm aside from those of Plumier and Descourtilz and those old portraits, like many others of their periods, are not accurate for details. In this paper, Figs. 153, 155, 156 are from my photographs. Fig. 157 is made by permission from a photograph taken in the United States Plant Introduction Garden, Coconut Grove, Florida, by H. F. Loomis.



156. ARMATURE OF ZOMBI PALM. One-half natural size.



157. THE HANDSOME WHITE FRUITS of *Zombia antillarum*. Natural size.

Aside from the vernacular *latanier zombi* I have heard the names *latanier savane* and *latanier piquant* applied to this palm in Haiti.

The foregoing account of the zombi palm was put in type for my last paper (Gent. Herb. iv, fasc. vi) but on reading the page proof I was in doubt about a statement I had written, and therefore at the last moment I withdrew the article and held it in type until I made another visit to Hispaniola. That journey is now completed. I took the zombi again, in fruit, in the Gros-Morne region of northern Haiti and was able to verify my former observations.

Natives said the palm grows in the hills much to the north of Gros-Morne, perhaps in Nord-Ouest. Ekman reports it from the south, in Masif de la Hotte, near Miragoâne, but I did not see it in that region.

I found it on open and bushy slopes of hills, the area very dry in the heats of August. It grows in separate or isolated clumps or stools of different ages, the older ones with two or more trunks. Descourtilz gives it a wide range of habitat.

The tallest tree I encountered this year was 10 feet high over all, with about 8 feet of trunk. Ekman's notes call for a tree about 3 m. tall. In his diagnosis from the Buch collection Beccari supposed it to be a tree of medium height (*arbor mediocris*?). The plants build up a mound or cushion of fiber 12 to 18 inches high, and this tussock may remain after the trunk falls. The trunk dies and falls apparently after two or three fruiting periods; it may break off a short distance above the ground, but I have not seen such clear-cut stumps as are shown in the Plumier and Descourtilz pictures.

Close about the base of the clump of zombi palm are slender simple spines or pneumatophores, coming out of the ground 2 or 3 inches. They are not numerous as I have seen the plants in Haiti and I have not investigated their origin or morphology.

The fruits are stipelled or papillate before the surface becomes white and soft, but there are no distinctive marks. Cross-section through the middle at this period, when the contents are filled and firm, discloses a crosswise line or division as if the fruit were two-celled. When dried, the single seed is free within the thin firm shell or exocarp, attachment being at the base. Inside the shell are a few loose fibers. The seed splits into halves by a prominent commisure, and each half is toothed or notched. Albumen in the different parts is plain, without intrusions from the walls. The outside of the seed shows the furrows or lines of the subdivisions within.

The little thin spadices are much shorter than the leaves, and in Haiti they bore only scattered fruits. There the ripe fruits are collected for hogs.

In the search for zombi, as in many other quests in Haiti, I have had the indispensable aid of Pierre Sylvain, attached to the agricultural services of the Republic and student of Haitian affairs.

157. The handsome white fruits of *Zombia antillarum*. Natural size.

Separation of Zombia counts four genera in the Tribe Thrinaceæ. The others are Thrinax, Hemithrinax, Coccothrinax. This Tribe is part of the Series Corypheæ, comprising most of the palmate or fan-leaved palms, which are about one-fifth the total genera of the Family Palmaceæ. The Family divides itself naturally into two Subfamilies: Eupalmeæ with ovary and fruit tricarpellate (to unicarpellate); Nipeæ (Family Phytelephantaceæ, Cook) with ovary and fruit syngoniate, comprising the genera Nipa and Phytelephas.

ARTICLE 17. COCCOTHRINAX IN THE SOUTHERN GREATER ANTILLES.

This year Brother León has published on the Coccothrinaces of Cuba: Memorias de la Sociedad Cubana de Historia Natural, xiii, nos. 2, 3. I shall therefore not discuss these palms of that great island in the present paper; but inasmuch as the genus has not been technically analyzed in the remaining West Indies I shall attempt a brief review, particularly with reference to the other Greater Antilles, Jamaica, Hispaniola, Puerto Rico.

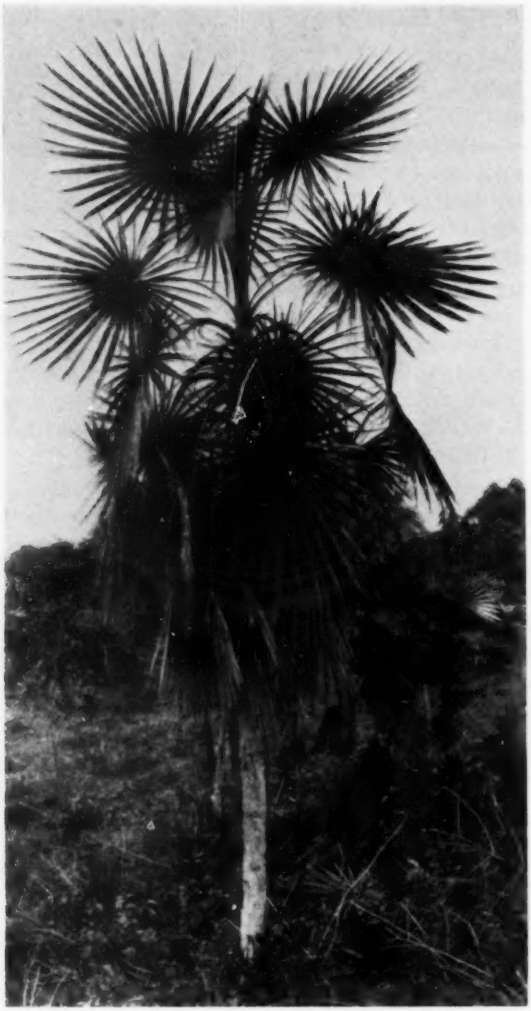
Five months ago I undertook to discuss the identity and the nomenclature of the palm in Florida and the Bahamas currently known as *Coccothrinax argentea*. I arrived at the conclusion that this species is distinct from the Antillean palm known under the same name, and was obliged to bring up an older nomen for it, making the binomial *Coccothrinax argentata:* see fascicle vi, Gentes Herbarum, volume iv. At that time I wrote that "what is to become of the West Indian *C. argentea* I shall discuss in another paper." We now arrive at that quest.

There may be objection to two names in one genus so near alike as *argentata* and *argentea*, but this is not my choice. If we adopt them both for different palms it may lead to habits of greater precision in the use of plant names, a result not to be deplored.

Brief history of the name *argentea* was printed in the other paper, so the circumstances need not be repeated here. The name first appeared under Thrinax. The first description by Schultes in 1830 is of young leaves only and is not sufficient to determine even the genus as genera are now understood. We have naturally applied the Schultes name to a silvery or argenteous-leaved palm, yet there is no mention of this color in the description; on the contrary, the leaves are said to be shining green. Habitat of the palm was unknown. The authors had seen specimens from the Munich collection sent there by Loddiges who had grown the plant. These specimens are not now at Munich, and even if they were in evidence they probably would not verify the species. We must have subsequent description or pictures.

This subsequent evidence is in Martius, Historia Naturalis Palmarum, 1838. Martius gives a full description except that he did not know the flowers. He has two pictures, one of a tree and another of the fruit and seed. Whether the account was drawn mostly from cultivated or feral material is not disclosed. He says it is native in the Antilles, and he mentions partic-

ularly Jamaica, Haiti-Santo Domingo, the Bahamas. As there are several species of Coccothrinax on those islands we shall have difficulty in typifying *Thrinax argentea*, for descriptions in those days gave few characters that can be employed with much confidence today in distinguishing closely related kinds. The picture of a tree represents a plant in Santo Domingo, but it does not prove the species. He cites *Palma argentata* of Jacquin as a synonym but this does not help.



158. REPRESENTATIVE TREE of *Coccothrinax argentea*. Haina, Santo Domingo. Note the very different hang of leaves in *C. argentata*, Fig. 141, fasc. vi.

Certain items in the Martius description may be noted. He has a tree 12-15 feet tall. The trunk is 2-3 inches thick; it is strongly and persistently vaginate, a character that might more or less disappear in the wild. The leaves are silky-silvery underneath; this is important. Spathes are membranous and acute. Spadix is 1 foot long and the branches are 4-6 inches, the flowering parts 1½ inches long. Fruit is depressed-globose and sulcate. The picture of the fruit, natural

size, represents it as about 8 mm. across; the external marks appear to indicate a Coccothrinax; in his explanation of the plate Martius mentions the ruminate character of the seed. There is no indication that the fruit had a pulpy exocarp.

Description of the short spadix together with the illustrated section of the fruit and seed sufficiently establish the plant as a Coccothrinax. To which one of the Antillean species we may confidently attach the name *argentea* is less apparent.

The mention of the leaves silvery underneath throws the plant into one of the divisions of the genus, but the silveriness of leaves is a somewhat variable character between foliage young and old, and it is often less evident on dried specimens. There is no indication whether the flowers and fruits of the Martius plant were sessile or pedicellate. In these circumstances we must rely mostly on the size of the dry fruit and the nature of its exterior. The mention of Santo Domingo as the native place of the tree he figured leads us to look for *argentea* on that island; and probably the location at that time would not have been far from the main port. When we decide on the plant best entitled to receive the name *argentea* we shall incur the responsibility of making the first designative diagnosis of the species even though the name has been current for a century.

This year I made search in Santo Domingo for a Coccothrinax to harmonize with the account in Martius, and found it abundantly and in close proximity to the old port, Cuidad Trujillo. This palm is shown in Figs. 158, 159. First, however, we must have a key to the Coccothrinaces of Jamaica, Hispaniola, Puerto Rico. The reader will have noted that I have otherwise disposed of *C. anomala:* see Zombia. Most of the species do not require definition here, inasmuch as they are modernly described. Certain of the distinctions in hastulas are seen in Fig. 164.

I. Fruits covered with small tubercles: style persistent on apex: leaf-sheaths produced into stiff prongs or spines. Hispaniola..... 1. *C. Ekmanii*

II. Fruits smooth or with only the remains of a fleshy exocarp: style deciduous: leaf-sheaths not developed into thongs or spines.

A. Flowers and fruits sessile: leaves prominently silky-white underneath: dry fruit 8 mm. diameter, exterior not fleshy and becoming a hard thin brown or gray or blackish shell: spathelets small and very narrow. Hispaniola..... 2. *C. argentea*

AA. Flowers and fruits very shortly pedicelled, the stalks tubercle-like and about as broad as long: leaves similarly green on both surfaces: fruit large, white and with fleshy exterior. Hispaniola..... 3. *C. montana*

AAA. Flowers and fruits distinctly pedicelled or stalked, the mature pedicels thinner than long.

B. Pedicels of mature fruit short, mostly 2 mm. or less long.

C. Leaf-segments extending about two-thirds to base of blade, those in middle of full grown leaves 3 cm. broad and very slender-pointed, gray but not silvery or white underneath: trunk thick, sometimes ventricose: fruit with fleshy purple exocarp, 7-10 mm. across when dry. Hispaniola..... 4. *C. spissa*

CC. Leaf-segments 2 cm. or less broad and extending nearly or practically to base of blade: fruit smaller.

D. Foliage silvery-white underneath. Hispaniola.....5. *C. gracilis*
DD. Folliage green both surfaces. Hispaniola.....6. *C. concolor*
BB. Pedicels of mature fruit (or most of them) slender and long, 3-5 mm. or more.
C. Segments narrow, commonly 2.5 cm. or less at middle, finely parallel-veined, not cross-veined or strikingly white-silvery underneath but sometimes bluish on the tree, glossy above as if glazed. Cuba, Jamaica, Hispaniola.....7. *C. fragrans*
CC. Segments at middle of leaf often 3-4 cm. broad, cross-veined underneath and silvery, not glossy or glazed above. Puerto Rico...8. *C. alta*

1. **Coccothrinax Ekmanii,** Burret, in Kungl. Svensk. Vetensk. Akad. Handl. ser. iii, vi, no. 7, 11, t. 4 (1929).

Haiti: Gros-Morne des Commissaires, Sud. *Ekman 6991.* An odd palm, probably representing a distinct genus, with leaves shining green above and whitish underneath, to 5 m. tall, slender, leaves divided nearly to the

159. SPADIX of *Coccothrinax argentea*, with sessile fruits; spathelets small. About one-half natural size.

base: fruit small, in dense small clusters (not described in fully ripe condition), spathelets very narrow and sharp-pointed. The prong-like extensions of the trunk sheaths suggest Zombia.

2. **Coccothrinax argentea,** Sarg. in Bot. Gaz. xxvii, 89 (1899). GUANO (Santo Domingo). LATANIER BALAI (Haiti). Figs. 158, 159, 164.
Thrinax argentea, Lodd. ex Schult. & Schult. in Linn. Syst. Veg. vii, pt. ii, 1300 (1830); Martius, Hist. Nat. Palm. iii, 256, t. 103, 163 fig. iii (1838).
Coccothrinax scoparia, Becc. in Fedde, Repert. vi, 95 (1908).

Very slender field and coppice palm with single stem although sometimes growing in colonies, to 10 m. and more tall and to 1 dm. thick, bearing a thin and nearly regularly woven webbing, the head or crown scant and thin and at maturity small: leaf-blade nearly circular in outline although somewhat elongated in middle, cordate at base, 50-75 cm. long, divided about three-fourths distance to base into 30 or more segments of which the central ones may be 3 cm. broad, the segments usually not individually or separately drooping, upper surface green and dull, under surface silvery and possessed of short fine open pubescence, the two apical points long slender and very narrow; petiole very slender, nearly or quite as long as the blade, convex both surfaces; hastula broad and short and with a various projection in the center that stands above surface of blade: spadix about one-half length of petiole, 30-40 cm. long, bearing about 3 fertile narrow long-pointed spathelets and 1 or 2 sterile spathelets at base, the rachillæ slender, commonly less than 2 mm. thick when dry, essentially glabrous although sometimes caducous-cottony at first; blade of spathelets (above the ventral sinus) 4-7 cm. long and 2-3 cm. broad: flowers small, sessile, floral envelopes very narrow and pointed and shorter than the pistil which is equalled or exceeded by the 6 conspicuous and lobed light colored anthers: fruits depressed-globose, with firm exocarp that becomes a thin shell, 8 mm. diameter when dry, glabrous, brownish to nearly black, the surface even, base subtended by the sharp envelopes; seed free within the shell, about 5 mm. diameter, brown, deeply furrowed or split into 5 parts.

Hispaniola, in both Haiti and Santo Domingo, common in many dry and rocky areas, sometimes as scattered separate trees and sometimes in more or less continuous colonies. Description drawn largely from *Bailey 269*, Haina, Santo Domingo, Figs. 158, 159.

The Florida and Bahamas silver palm, *Coccothrinax argentata*, Bailey, with which *C. argentea* has commonly been confused, differs at once in its smaller stature, in the droop or hang of its narrower and glazed leaf-segments (compare Figs. 141, fasc. vi, and herewith), and particularly in the pedicellate fruits that at first have a pulpy exocarp which, when shed, may leave a dry shell 7-8 mm. diameter; spathelets much smaller and less long-pointed.

Thrinax multiflora, Martius, Hist. Nat. Palm. iii, 255, t. 103, was re-

ferred by Beccari to *Coccothrinax argentea*, and we have all followed. A good glance at the Martius plate, however, shows the elongated spadix and short lateral branches, and section of seed with continuous centralium or cavity, of a Thrinax.

160. OUTSTANDING TREE of *Coccothrinax spissa*. Near Bani, Santo Domingo. Lower leaves have been cut for thatch or other uses.

Beccari states (Webbia ii, 319) that a specimen from Santa Domingo collected by Heneken is in the herbarium at Munich and that it provided Martius with material for his drawing of flowers of *Thrinax multiflora* (Martius also makes this statement), which he refers to *Coccothrinax argentea*. I have seen flowers of the Heneken collection but do not identify them.

The fruit and seed in the Martius plate, however, wherever they came from, are plainly a Thrinax of the *T. parviflora* group. It is evident we cannot accept the Beccari typification of *Coccothrinax argentea*.

Another plant referred to *C. argentea* is *Thrinax graminifolia*, Hort. Belg. This palm is known to us by two illustrations and horticultural accounts of a juvenile plant in L'Illustration Horticole, xxxi (1884) and xli (1894). It is unidentifiable; it may be *Thrinax parviflora*, but I shall now treat the binomial as a *nomen incertum*.

Thrinax longistyla, Becc. in Urban, Symbol. Antill. vii, 170 (1912), Ann. Roy. Bot. Gard. Calcutta xiii, 335 t. 29 (1931), is referred to Coccothrinax by Burret. The plant was described without fruits, however, and determination is difficult. It was described from near Barahona, Santo Domingo, known as Guano. I suspect it is *C. argentea*.

3. **Coccothrinax montana,** Burret, in Kungl. Svensk. Vetens. Akad. Handl. ser. iii, vi, no. 7, 17 (1929).

Hispaniola: Loma Nalga de Maco, in calcareous formation, Cordillera Central, Province Azua, Santo Domingo, about 1700 m. altitude (*Ekman H 6297* type); Massif de la Selle, near Robergeau, Haiti, about 1700 m. (*Ekman H 1673*).

† 4. **Coccothrinax spissa,** spec. nov. Fig. 160.

Truncus simplex, validus, sæpe ventricosus, ad 7-8 m. altus: folia alte divisa, supra viridia infra argentea pubescentiaque, acuminibus longis et alte bifurcatis: spadices infrafoliares, non elongatæ, spissæ, rachillis lateralibus 6-10 mm. longis et validis: spathæ et spathillæ breves latæque, non attenuatæ: fructus purpureus, 9-10 mm. diam. cum siccus, pedicellatus, exocarpio carnoso; semen 7 mm. diam. valde sulcatum. Differt a *C. argentea* multo validiore trunco interdum ventricoso, folii segmentis pendentibus, spissa inflorescentia, floribus et fructibus pedicellatis, magnis, oblatis, purpureis, carnosis fructibus, majoribus seminibus.

Trunk stout and thick, 3-7 or 8 m. tall, sometimes 12-16 cm. diameter throughout, at other times boldly ventricose at middle or near apex and then 30 cm. thick, faint rings persisting, webbing rather coarse but bole soon cleaning itself; head or crown rather close and dense, the leaf-segments tending to droop or hang separately: leaf-blades 75 cm. or more long and nearly as broad, divided two-thirds to the base into 40 and more narrow segments to 3 cm. broad at middle, very deeply bifurcate into narrow whip-like lobes or points, light colored or gray underneath but variable in this respect, green above, veins many, uniform and faint either side of rib; petiole 2 cm. or more broad and with only indifferently convexed surfaces, equalling or exceeding the blade in length; hastula broad and rounded and usually with a blunt short point: spadices closely clustered, heavy although not large, the panicles 3-5 and 25 cm. long in fruit, simple side branches or rachillæ of panicle stout, more than 2 mm. thick when dry, 6-10 cm. long, essentially glabrous; spathelets firm, short and broad, 6 cm. or so long above ventral sinus and nearly as broad, apex not long-attenuate: flowers short-pedicelled, about 2 mm. long, the envelopes very sharp-pointed and not exceeding the globular ovary, 6 anthers about equalling the large stigma: fruit flattened endwise, on stout pedicels 1-2 mm. long, large, to 11 or 12 mm. diameter when fresh and mature, 9-10 mm.

161. CHARACTERISTIC TREE of *Coccothrinax fragrans* in Jamaica.

when dry, bright purple, the fleshy exocarp forming a rough and wrinkled surface in drying and perhaps disappearing with much weathering; seed about 7 mm. diameter, marked with lines but hardly split into parts.

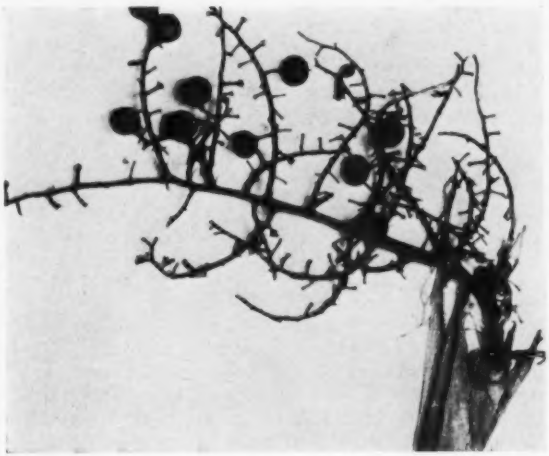
Hispaniola. Southern Santo Domingo, particularly characteristic in the dry Azua and neighboring country. Diagnosis drawn particularly from *Bailey 271*, collected three kilometers east of Bani, Santo Domingo, Fig. 160. Specimens taken before the soft or pulpy purple exterior of the fruit develops may not at once disclose themselves, although the stout pedicels would be prominent. This species is apparently in Haiti at Terre Rouge in Ouest and near Gros-Morne in Artibonite, and elsewhere, but more material is needed; and other species may be involved.

Known by its thick trunk, spiss or compact fruiting clisters, large purple fleshy pedicelled fruits.

In dry open country near Santiago, Santo Domingo, I have taken a palm similar to *C. spissa* but with characters that indicate an undescribed species. It has a fairly slender trunk, leaves distinctly white-pubescent underneath, hastula broad and retuse, petiole white-floccose at least at apex, spathes and spathelets smaller and acute, rachillæ more slender, dry fruit 8-9 mm. across and apparently not purple, pedicels stout and about 2 mm. long.

5. **Coccothrinax gracilis,** Burret, l. c. 14 (1929).

Haiti, in both Nord-Ouest and Sud, in calcareous country, collected by Ekman. A slender palm 2 m. tall: leaves very deeply divided into slender parts, prominently silvery underneath: fruit-cluster small, bearing perhaps 25 or fewer fruits 6-8 mm. across when dry: spathes narrow, acute.



162. FRUITING SPADIX of *Coccothrinax fragrans* in Jamaica. About five-eighths natural size. Note the long pedicels.

6. **Coccothrinax concolor,** Burret, l. c. 13 (1929).

Haiti, on volcanic hillsides,

Jacmel, Ouest, collected by Ekman. Slender green-leaved palm to 4 m., segments extending practically to base of blade: clusters small, the peduncle slender: spathes narrow, very short-pointed: mature fruit not described.

7. **Coccothrinax fragrans,** Burret, l. c. 15 (1929); León, in Mem. Soc. Cubana Hist. Nat. xiii, 137, fig. 3, pl. 16 fig 5, pl. 18 fig. 2 (1939). SILVER THATCH (in Jamaica). Figs. 161, 162, 164.

Eastern Cuba, region of Santiago de Cuba, several collectors; Jamaica, where widespread and passing as *C. argentea;* Tortue Island, northern Haiti, Ekman; type from Cuba, *Ekman 8031.* Known by its yellow very fragrant flowers, which are in condensed shortly pedunculate clusters, leaf-segments narrow and glazed above: spathes not enlarged: fruit 6-8 mm. across when dry, the thin fleshy exocarp becoming wrinkled or granulate: trees to 5 m. tall, slender. Plants vary in cut of leaves, as I have seen them in eastern Cuba, and apparently in the bluish cast of the under surface of leaves; some trunks bare, others covered in a loose netting. In thickety places in Jamaica, among logwood scrub, near Savanna-la-Mar in Westmoreland, I have taken it with spadices 2 feet long, and handsome smooth foliage with bent-over segments (Fig. 161) but not the hanging segments of *C. argentata,* which it resembles; and it differs from that Florida species in the less pronounced silvery under surface of the leaves and usually less shiny above, absence of lateral ribs in the segments, larger and more upstanding hastula, smaller less fleshy fruits, longer thinner pedicels, spathes and spathelets much larger, stamens more numerous.

Specimens from Jamaica at Pedro Bluff in St. Elizabeth were collected by *Wm. Harris 9737;* at Yardley Chase in St. Elizabeth by *N. L. Britton 1156.*

8. **Coccothrinax alta,** Becc. in Webbia, ii, 331 (1907). Figs. 163, 164,
Thrincoma alta, Cook, in Bull. Torr. Bot. Club, xxviii, 540, tt. 43, 44 (1901).
Thringis laxa, Cook, l. c. 545.
Thringis latifrons, Cook, l. c.
Coccothrinax ? laxa, Becc. l. c. 333.
Coccothrinax latifrons, Becc. l. c. 326.
Coccothrinax argentea, Britt. & Wils. in Bot. Porto Rico and Virg. Isls. 1, 117 (1923), not Lodd.

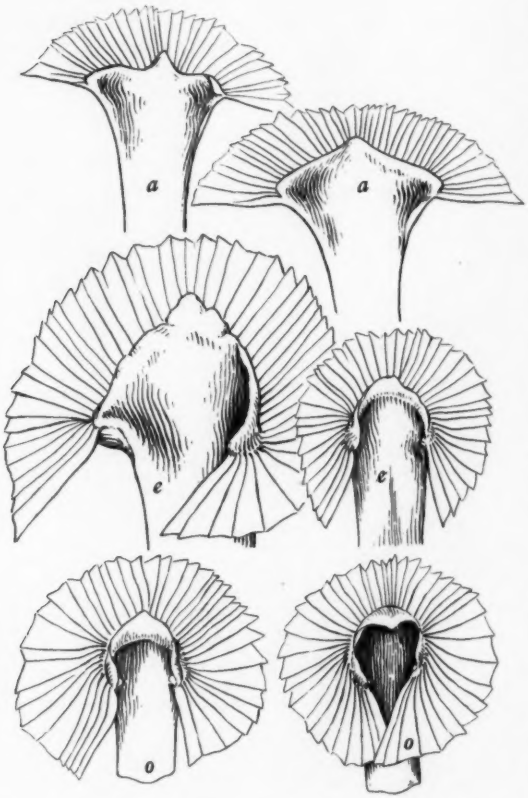
Tall and slender single-trunked tree to 8 or 10 m. tall and bole 15 cm. thick, bearing rather sparse head or crown of perhaps 15 leaves at maturity, the trunk when not shed with age loosely wound with coarse very open stramineous webbing: leaf-blade nearly orbicular in outline, 65-75 cm. from petiole to apex, bright green above, silky-silvery underneath, cut one-half to two-thirds its depth into many segments that are long-tapering to a bifid apex and the main ones 18-40 mm. broad at widest part, midrib of segments not strong on upper surface and somewhat sunken, side

163. Two full grown trees of *Coccothrinax alta*. Near Coamo Springs, Puerto Rico.

veins numerous and fine and parallel, usually no prominent cross-veinlets except on under surface; petiole equalling or exceeding blade, slender and thin, somewhat convex on both surfaces; hastula prominent, briefly prolonged in center, upstanding from blade, high sides at base incurved and sometimes nearly closed: spadix much shorter than petiole, 30-50 cm. long, with 3 to 5 side panicles or subspadices to 25 cm. long, glabrous, each panicle with a continuous central axis and simple divaricating branches 6-10 cm. long at fruiting time; spathe and spathelets small short and narrow, blade of central spathelet about 5 cm. long beyond ventral sinus and 15-25 mm. broad and short-pointed: flowers small, scattered, each subtended by a pointed bract about as long as the pedicel or frequently longer: fruit on pedicels 2-3 mm. long, oblate, 7-8 mm. across when dry and the thin flesh is shrunken, becoming brown-black; seed about 5 mm. across, somewhat flattened endwise, strongly many-furrowed from the apex.

Puerto Rico, on low hills and slopes; frequent; an attractive small palm, with foliage conspicuously silvery underneath but not glazed above. Vigorous young trees with large white-bottomed long-stalked widely separated leaves are attractive objects.

Three binomials by Dr. Cook may be investigated for this plant, all proposed in 1901 for Puerto Rican palms: *Thringis laxa* and *Thringis latifrons*, *Thrincoma alta*. Britton refers the first to *Thrinax microcarpa*, the second and third to *Coccothrinax argentea*. Type specimens, as preserved, are not sufficient to settle the identities. Original description of the genus Thringis places it definitely in Coccothrinax, its predecessor by two years: "seed cerebriform, irregular, with wide furrows and convolutions," and seed of *T. latifrons* is further noted as having "deep folds and convolutions." The genus Thrincoma, also, has "seeds with few longitudinal grooves." I choose the Thrincoma name, *alta*, because it occupies first position in the original account of these palms and particularly since it is reinforced by a good picture of the seeds in his plate 44.



164. HASTULAS IN COCCOTHRINAX, natural size. *a,a. C. argentea. e,e. C. fragrans. o,o. C. alta.*

Britton refers the Beccarian names *Coccothrinax sanctithomæ*, *C. Eggersiana* and its var. *sanctæcrucis* (Webbia, ii, 1907) to *C. argentea*, but I am not so certain of these identities. They are all of the Virgin Islands. *C.*

sancti-thomæ is keyed with species of which the fruits are not pedicellate (*quasi sessili* in the Italian text), and *C. Eggersiana* with species having flowers and fruits more or less pedicellate; but of *Eggersiana* in the text the fruits were not known and flowers were *quasi sessili*. Fruits of var. *sanctæ-crucis* were also unknown but the flowers were a little more pedicellate. In what I have collected at the fruiting stage of Virgin Island Coccothrinax the pedicels are well marked although short. Photograph of the type sheet in Copenhagen of *C. Eggersiana*, in bloom, shows distinct but short pedicels. I assume, in absence of sufficient specimens from the Virgin Islands, that the two binomials may represent forms of a single species, diagnosis of which we are not yet able to draw.

This palm, *Coccothrinax alta*, is apparently widespread in cultivation, under various names. What I have seen planted as *Thrinax altissima* appears also to belong here.

ARTICLE 18. GEONOMA OXYCARPA.

In his Flora of the British West Indies Grisebach attributes *Geonoma oxycarpa*, Martius, to Trinidad as well as to Haiti. It has not been found in Trinidad, however, or at least it is not among the large official collections of the palms of that island now in my hands for study nor have I seen it there. Probably one of the forms of *G. vaga* was mistaken for *G. oxycarpa*.

The real *Geonoma oxycarpa* is now infrequently collected on its island, Haiti, although Ekman records it as very abundant in certain parts of Massif de la Hotte in the south of that country. The species was founded in 1847 by Martius in the now unobtainable Palmetum Orbignianum in a quotation from Plumier whose locality was *circa portum Pacis*, which is now Port de Paix, northern Haiti. Ekman got it in that region in 1925. The only specimen I have seen under this name from Santo Domingo was a Calyptronoma too scant for determination as to species.

Apparently Martius had no specimens of *Geonoma oxycarpa*. Apparently, also, the species had not been carefully studied until Burret identified the collections of Ekman and published them in 1929. No pictures have appeared of the species, that ascribed to Plumier not having been published. Some of the Ekman material I have seen.

In Haiti this Geonoma is known as coco-macaque, as are other species of this genus in the French Antilles. Walking sticks are made of the trunks. What I have seen in cultivation in Hispaniola, however, as coco-macaque is *Dracæna fragrans*.

In writing of West Indian Geonomas in my last paper (Gent. Herb. iv, fasc. vi) I stated: "The one on Hispaniola is *G. oxycarpa*, Martius, with which *G. mexicana* has been combined, although the two appear to be quite unlike; this question I hope to discuss in another paper."

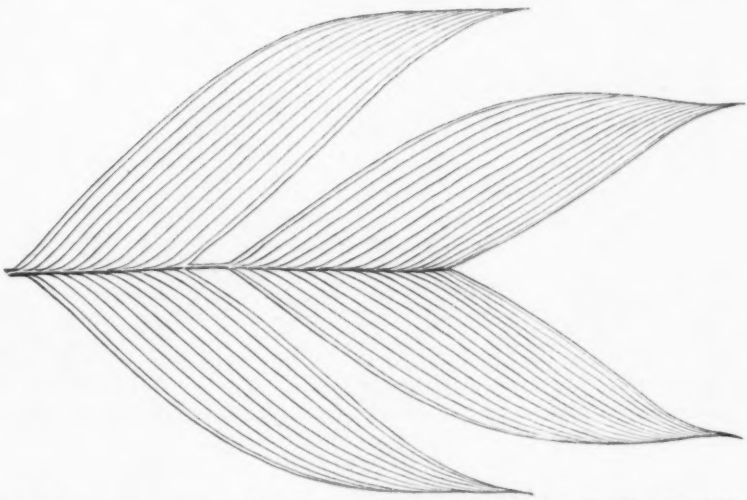
One would hardly expect a Haitian woods palm to be native also in Mexico. Original diagnosis of *G. mexicana* calls for paniculate-multifid spadices with cernuous branchlets, interfoliar and terminal; these characters are shown also in Liebmann's unpublished drawings.

This year, 1939, I took *Geonoma oxycarpa* in dense mountain woods in Sud, southern Haiti, at about 4500 feet. Trees coming into bloom were about 4 feet tall; spadices were all infrafoliar, borne below the leaves on the trunk; branchlets were straight and not at all cernuous; spathe-valves not long-acuminate as in the Liebmann picture of *G. mexicana;* pinnæ not so narrowly and gradually long-acuminate as in that species; fruit in *G. mexicana* not conic-acute as in *G. oxycarpa*. Inflorescence, with spathe at

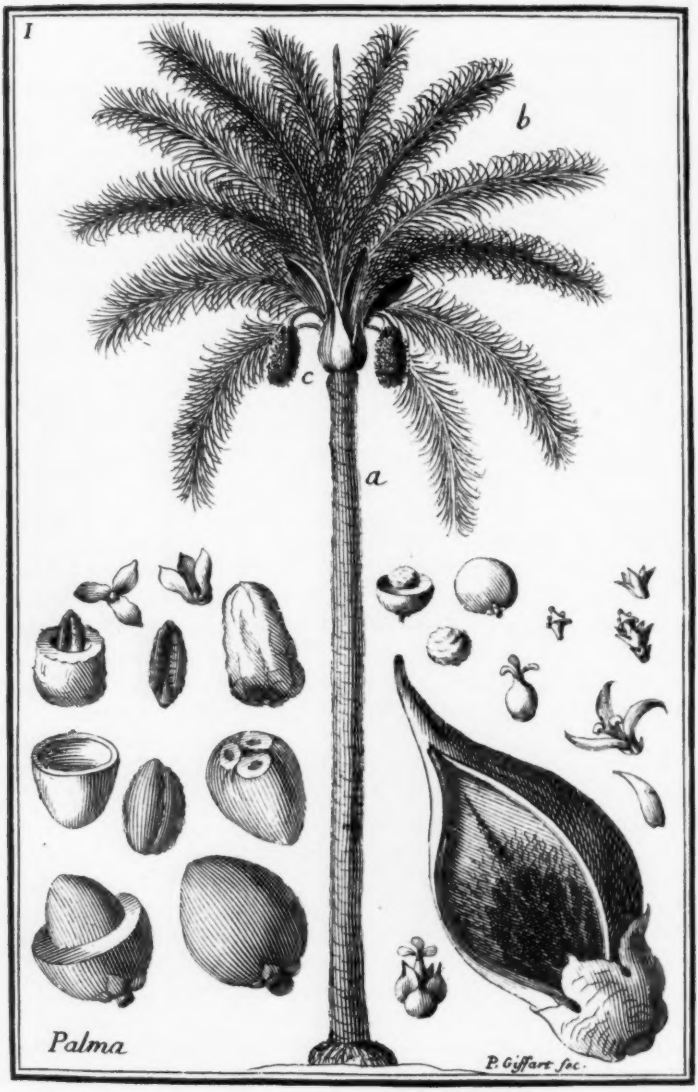
base, is shown in Fig. 165, and upper half of leaf in Fig. 166, from my Haitian collection.

Conclusion is inescapable that *Geonoma oxycarpa* and *G. mexicana* are distinct species, and that the former is known only in Haiti although one would look for it also in Santo Domingo.

165. INFLORESCENCE, WITH SPATHE, of *Geonoma oxycarpa*. Haiti. Nearly one-third natural size.



166. UPPER PART OF LEAF of *Geonoma oxycarpa*. Haiti. About one-fourth natural size. Intermediate very narrow pinnæ or divisions may occur on some of the leaves.

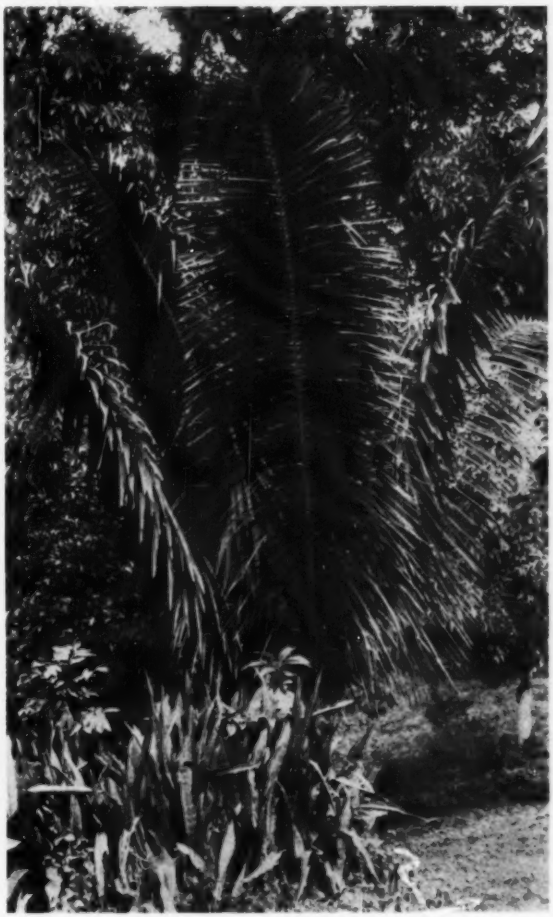


167. Picture by Plumier, 1703, of the palm now known as *Attalea crassispatha*.

ARTICLE 19. THE GREAT CAROSSIER.

Once more we go back to the artist, Charles Plumier. In 1703 he published a plate of *Palma cocifera, vaginis ventricosis et liratis* in his Nova Plantarum Americanarum Genera. This picture is reproduced in Fig. 167. His plant grew on the island of Hispaniola in the region called Vache et le fond des Nègres, in Haiti. Here Ekman, the searching Swedish collector, found two trees of it about twenty years ago; in the meantime it appears to have been overlooked. He estimated the palm was 20 meters tall.

In 1939 I found the tree from which Ekman collected specimens: a native said he was with Ekman at the time. Resident's estimated the tree to be now about 30 meters tall, but I guessed it may be somewhat less than



168. HANDSOME YOUNG TREE, NOT YET MAKING A TRUNK, of *Attalea crassispatha*.

that height. The trunk is thick and heavy. I also saw two small trees, relatively recent seedlings; one of these seedlings, not yet making a trunk and with leaves 12 to 15 feet long, is seen in Fig. 168. Such a rare and mighty object, the shaft spreading its capital high against the sky, merits a new record here, for benefit of palm lovers.

Karl Frederick Philip von Martius (1794-1868), in his search of the palms of the world, published the Plumier tree as *Maximiliana crassispatha* in his Palmetum Orbignianum, page 110, in 1847; it also appears in his monumental Historia Naturalis Palmarum. He did not leave us a picture. Ignatius Urban in his index to the names of Plumier (1920) refers the old account to *Maximiliana crassispatha* of Martius, with remark that the tree is unknown to botanists today and the genus is dubious: see Fedde's Repertorium, Beihefte to volume v.

The Ekman material went to Dr. Max Burret, Berlin-Dahlem, contemporary authority on palms. He recognized it as of the genus Attalea and published it as *A. crassispatha* (Kungl. Svenks. Vetens. Akad. Handl., ser. iii, vi, no. 7, 23, 1929). This is the name the great palm now bears. Burret made plates to show floral characters and outlines of fruits. Pictures printed herewith will help to complete the record.

All the collections have been made at Fond-des-Nègres, in the eastern part of Massif de la Hotte, Sud, Haiti. One wonders why the species does not grow elsewhere in Haiti, or why, if it is so limited, it has persisted in a few trees since the years of Plumier. Such a conspicuous palm would hardly have escaped Ekman elsewhere, for he spent much time in Haiti.

169. WOODY SPATHE, CONTAINING THE SPADIX, of *Attalea crassispatha*. About one-fifth natural size.

The leaves of carossier tend to stand somewhat edgewise, up and

down, in the top of the tree. The juvenile leaves, as shown in Fig. 168, are closely set with pinnæ, in almost numberless pairs. The pinnæ are firm and sword-like, glabrous except scurfy on midrib underneath, the rib strong and often appearing double on the upper surface, the lateral veins several to many and fine.

The spathe as it lies on its back on the table in front of me, and as shown in Fig. 169, is a heavy stiff durable affair, the wood nearly $\frac{3}{4}$ inch thick in places, furrowed outside on the lines of old veins. It measures 42 inches long on the curve and 16 inches broad. Within it lies the spadix, and on the table are ripe fruits that have fallen.

The nuts in their fibers are $1\frac{1}{4}$ to $1\frac{3}{4}$ inches long, tapering to a short beak or point. They are well presented about natural size in Fig. 170, an open husk showing at lower left, kernel at lower right, cross-section at middle bottom. The shell is very thick and hard. At the apex, underneath the fiber, are three characteristic eyes or large micropyles, for this palm belongs to the Cocos tribe. Albumen is hard and plain, not ruminate, although cavitous in center.

170. Dry nuts in their shucks of *Attalea crassispatha*. Approximately natural size. Kernel at lower right.

ARTICLE 20. THE ROYAL PALM OF HISPANIOLA.

One does not know why a certain genus of palm presents but a single species in the different parts of the West Indian chain and other genera differentiate on the main islands. Example of the former is *Euterpe globosa*, of the latter Sabal, Geonoma and Roystonea. *Roystonea regia* is the Cuban species; the Floridian royal has been named *R. floridana* but botanical distinctness from *regia* is not yet established; *R. regia* is not known elsewhere as a native, its assignment to Panama being an error. *R. jamaicana* and *R. princeps* are native only on Jamaica. *R. borinquena* is confined apparently to Puerto Rico. *R. oleracea* is native in the farther Caribbees. We come now to Hispaniola.

Until the present year we have had no discussion of the identity of the Hispaniolan royal; now we have an entertaining paper on the subject in National Horticultural Magazine for April 1939 by O. F. Cook. Barker and Dardeau in Flore d'Haiti, 1930, call the Hispaniolan plant *Roystonea regia*, and apparently do not regard it as indigenous although much planted and springing up in a wild state (*pousse souvent à l'état sauvage*). Certain coins of the two Hispaniolan Republics bear image of the royal palm.

In my former collecting in Hispaniola I concluded that the royal palm of that country, which occurs in great quantities in the interior, is distinct from both *R. regia* of Cuba and *R. borinquena* of Puerto Rico, and I gave it a binomial. Diagnosis was drawn. That account I have withheld from publication until I could again visit Hispaniola and repeat my observations. This year I observed *borinquena* again in Puerto Rico, then went immediately to Santo Domingo and Haiti where I saw the royal of those countries in great numbers, then returned directly to Puerto Rico and reviewed *borinquena* in many parts of the island. I concluded again that the native royals of Puerto Rico and Hispaniola are distinct. This conclusion disregards many of the palms one sees about villages, in parks and plantations, for interchange of seeds between various islands may have taken place over many years.

Dr. Cook, in the paper to which I have referred, writes: "The royal palm of Haiti appears to be distinct, and may bear the name of *Roystonea aitia*." No type specimen is cited nor a definite native locality, nor is there technical diagnosis as required under the Rules. The name is illegitimate under the Rules as a botanical binomial: see Taxonomic Index, number 6, June 1939, entry 345, for a related statement.

If the name *aitia* were adopted and validated by another author he

171. CLUMP OF SEVERAL SINGLE TREES of *Roystonea hispaniolana*. Haiti.

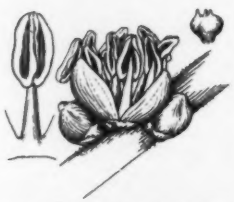
would be obliged to typify it, and this he might not wish to attempt, the original author still pursuing his work. Nor am I myself clear about some of the points in the account. Cook states his species is represented particularly in a grove of very slender royals at Port-au-Prince, shown in his Fig. 8; he speaks of *aitia* being slenderer than the Cuban royal. At least three times I have visited this beautiful grove. Origin of the trees appears to be unknown. I have not seen a grove quite like it in the interior of Hispaniola, but can match it as to slenderness and height in my pictures of native stands near sea level in northeastern Cuba; these Cuban trees challenged me by their thin trunks and tallness; by careful test some years ago with a shadow method I estimated some of the trees to be 120 feet tall.

Nor, again, am I convinced that the remarks about the flowers of *R. aitia* apply particularly to the native Hispaniolan species. No mention is made of fruits. Flowers of the native palm show a distinct purple effect from the color of the stamens, and filaments are hardly cylindrical as stated. The Cuban species, *R. regia*, is distinct in its prevailingly more nearly globular fruits, its light colored less glomerate flowers (*laciniis . . . candidis*, HBK. 1816), petals thin and soft, stamens fewer and light violet (not purple), spadix branches glabrous at flowering time; and there are differences in the trees.

For these and other reasons I am impelled to publish my own binomial to designate the palm I have in mind.

Whether the Roystoneas, on their various islands, are to be interpreted as species or varieties is of no pertinence to the present discussion. This question I plan to raise at another time. Variation in Roystonea is not understood, nor can the subject be adequately approached until field observations are made and correlated, and until herbarium methods with palms are vastly improved. Much work must yet be undertaken in the genus.

† **Roystonea hispaniolana,** spec. nov. Figs. 171, 172, 173.

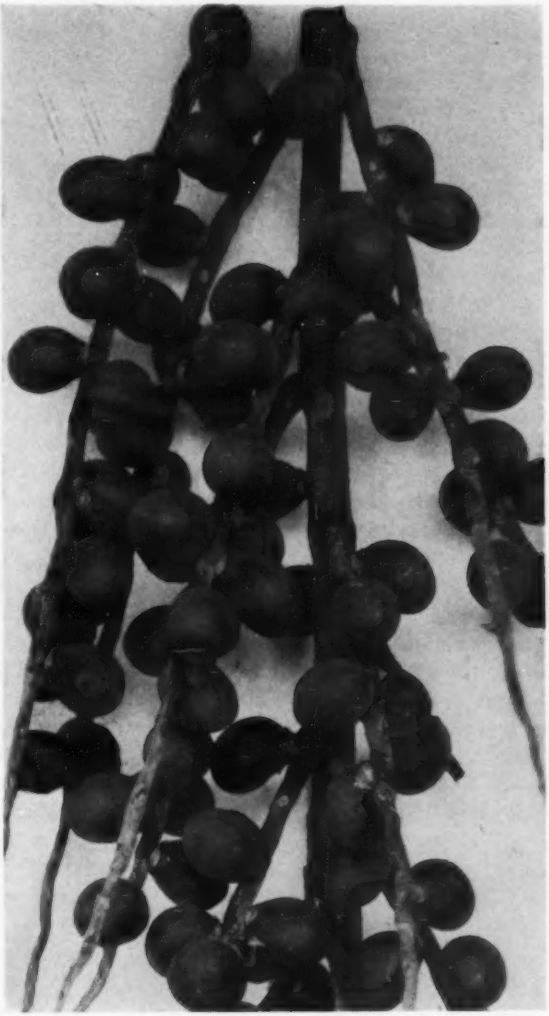


172. Staminate flower of *Roystonea hispaniolana*. Center, ×2; stamen at left, ×3; pistillode upper right, ×3. Two undeveloped pistillate flowers show at sides.

Alta gracilisque arbor, sæpe in latis plantationibus naturalibus: truncus non plerumque tumidus aut ventricosus, 15 m. vel plus altus: folia 20 vel plura in como, supra non nitida: differt a *R. regia* spadicibus pubescentibus vel furfuraceis, petalis fuscioribus et crassioribus, staminibus fere 8 vel 9 purpureis, floribus glomeratioribus, fructu fere minus globulari, sæpe majore: differt a *R. borinquena*, majore altitudine, minore tumescentia, como pluribus foliis, inferioribus foliis pendentioribus, pinnis non nitidis supra, rachillis pendentioribus, floribus minus compactis aut glomeratis in rachide, fructu non angustato ad basim.

Tall big palm with pubescent or scurfy-lanate

branches in spadix (particularly noticeable at blooming time) and sometimes 8 or 9 stamens, closely allied to *R. borinquena* but differing in habit and technical characters: trunk usually less stoutly columnar, often leaning or crooked or of irregular form, mostly lacking the regular upward enlargement toward the top and constriction toward the base of characteristic trees of the Puerto Rico species, the bole often without definite tumescence and prevailingly rather slender, making a less formal and stately tree unless sometimes when standing alone under good conditions: spadices (flower- and fruit-clusters) less compactly placed on the tree than in the other species (at comparable periods of anthesis and fruiting) and therefore not so clumpy in appearance, the parts more loosely and straightly pendent; rachillæ likely to be thinner or more slender: pistillate flowers less pointed when in bud at time of general anthesis; staminate flowers usually larger, the petals often broader, commonly 4 mm. across



173. FRUITS of *Roystonea hispaniolana*, natural size. For difference in shape, compare with *R. borinquena*, Fig. 216, Gentes Herbarum, vol. iii.

rather than 3 mm. when fresh: fruit (not the seed) when fresh and mature lacking an angustate base and appearing therefore to be closely sessile, breadth greater in proportion to length than in *R. borinquena*, the dimensions when full grown and before drying about 10 x 12 mm. in the two directions (varying from 10 x 11 to 10 x 13), with a broad basal end and a general rounded look. Fruits of *R. borinquena* may be expected to measure more nearly 9 x 14 mm. (9 x 13 to 9 x 15), and one side has a marked flattish or concave look. The fruits of *R. hispaniolana* are apparently more like those of *R. regia* than of *R. borinquena*, but the tree itself, stamens usually more than 6, markedly pubescent spadix and purple bloom, are unlike *R. regia*.

Individual trees in any of the species of Biseriate Roystoneas may not be evidently distinguishable in habit or port, but the general or prevailing shape runs in well marked series. About cities and residences in any of the islands one may find introduced species. It is not known whether the Roystoneas hybridize.

The Hispaniolan royal palm is abundant as a native tree in the Republics of Haiti and Santo Domingo, in fields, valleys and on low hills in many soils and situations, either as separate individuals or in groups of a few trees each, sometimes covering large areas with a continuous forest stand when the places are undisturbed. It seeds and propagates freely. It gives particular character to landscapes. Trees attain to 50 feet and more in height. My diagnosis is drawn from trees in the wild without confusion with planted or spontaneous subjects in the villages. Type, *Bailey 242*, on high land near Bonao, Province La Vega, Santo Domingo. Fig. 171 shows a clump of trees from valley of Rivière La Tombe, Haiti.

The Puerto Rican royal, *R. borinquena*, is a smaller tree than *R. hispaniolana*, lower in stature, not often occurring in forest-like areas, head or crown thinner (more open), lower leaves less drooping or hanging on comparable trees, pinnæ likely to be glossy on upper surface, spadix branches (particularly in fruit) not so long-hanging, spadices more visible or conspicuous beneath the crown, flowers more compacted or crowded together on the rachillæ. *R. hispaniolana* has more the aspect of *R. regia*.

In making comparison of heads of royals one must be careful to consider only trees that have not been cropped for thatch.

ARTICLE 21. THE SABALS OF HISPANIOLA.

Three binomials have been applied by Beccari to the palmettoes of Hispaniola: *Sabal neglecta* and *S. domingensis*, 1907, *S. haitensis*, 1931. In addition one must account for *Sabal umbraculifera* of Martius, 1838, said to be native in Haiti, Cuba and other Antilles. In the meantime I may express my conviction that the usual Sabals of Haiti and Santo Domingo represent a single kind and that variations in fruits account for all the proposed species. The three species were founded on very inadequate material. In the assumption that the prevailing species is single I am reinforced by the opinion of Professor R. M. Moscoso of Santiago de los Cabelleros, who has long studied the plants of Santo Domingo and who has now completed a Catalogus of the flora of that country.

It is not unlikely that other Sabals grow in restricted areas on Hispaniola, but the subject is not yet ready for report.

In my paper on Sabal, five years ago (fasc. vi, Gent. Herb. iii, p. 312 et seq.), I gave a history of the binomial *Sabal umbraculifera*, and was able to apply it only to plants in cultivation, and even then provisionally. Since that time I have seen the Sabals again in Santo Domingo and Haiti and am satisfied the Martian name may be applied to them.

Martius did not know the fruit of his palm, but inserted a brief statement about it from reports. In the scant knowledge of Antillean palms at that period we are not to place much reliance on reports. Martius took the name *umbraculifera* (umbrella-bearing) from Jacquin's *Corypha umbraculifera* and which that author applied to a plant growing under glass in Austria. Martius gives two good pictures of the inflorescence and details of flowers (t. Y, vol. i, and t. 130, vol. iii): it now remains to identify fruits borne by such flowers.

Until I collected Sabal on Hispaniola I was not able to verify the undulate or bent axes of the lateral spadices in Martius plate 130, nor very exactly the short acuminate spathelets in plate Y. The flowers of the Hispaniolan Sabal are somewhat variable from tree to tree (as in other species in the genus), and I am able sufficiently to match the details of the plate.

It has been thought that the Hispaniolan palmetto is the same as *Sabal causiarum*, Cook, of Puerto Rico. If a person experienced in palms were to observe native trees on the two islands he would not need to search first for technical characters of difference, but would be impressed by the relatively low stature of the Puerto Rican species, the large spadices much

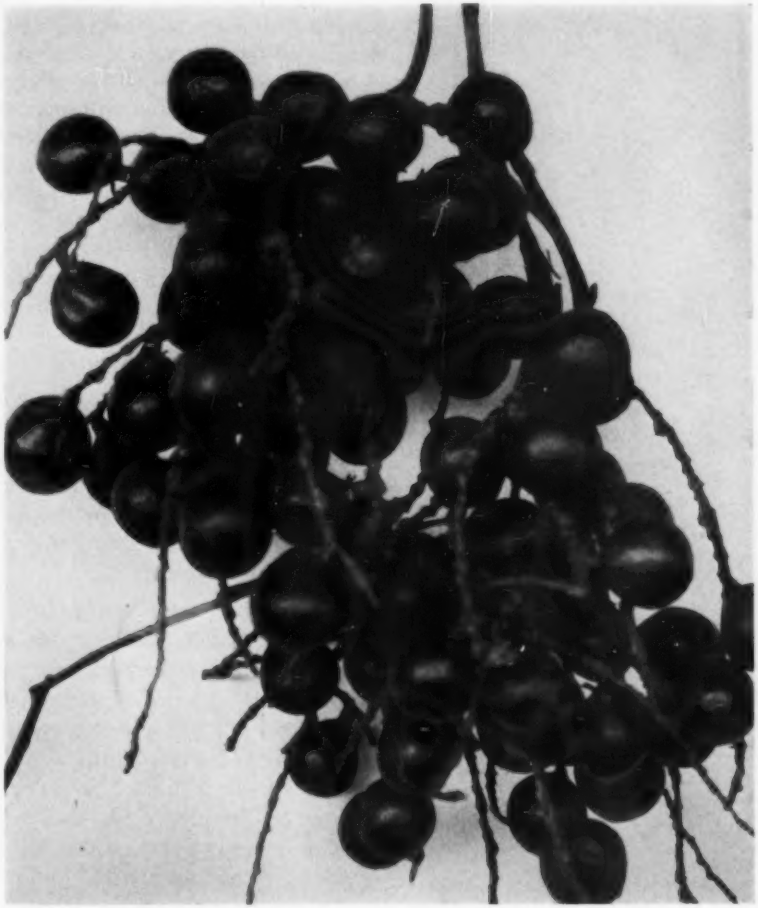
exceeding the leaves, the very narrow long-pointed outstanding leaf-segments; fruits are quite different.

Sabal umbraculifera, Martius, Hist. Nat. Palm. iii, 245, t. 130 (1838), and i, t. Y, figs. 5, 6, 7. Palma de Cana. Latanier Chapeau. Figs. 174, 175, 176.

174. Common palmetto of Hispaniola, *Sabal umbraculifera*. Central Santo Domingo. Right-hand tree is leaning, perhaps from effect of wind, but has straightened itself at top. Probably the most colossal of the palmettoes.

Corypha umbraculifera, Jacq. Frag. Bot. 12 (1800-1809), non Linn.
Sabal neglecta, Becc. in Webbia, ii, 40 (1907); Ann. Roy. Bot. Gard. Calcutta xiii, 292, t. 18 fig. E and t. 36 fig. 3 (1931).
Sabal domingensis, Becc. l. c. 49; 293, t. 18 fig. F and t. 35 fig. 6.
Sabal haitensis, Becc. in Ann. Roy. Bot. Gard. Calcutta xiii, 293, t. 20 fig. B (1931).

Very stout and tall tree, sometimes 50 feet high and probably more, trunk columnar but often not straight, perhaps leaning or bent, with age



175. FRUIT, FULL SIZE, of *Sabal umbraculifera*. Central Santo Domingo.

devoid of leaf-bases and shag and scars, the head dense, leaves not glaucous, segments sometimes 2 inches broad, filaments not conspicuous; spadices (inflorescence) shorter than leaves and likely to be hidden within the head; spathelets short, mostly 1 or 2 inches long and the main ones acuminate, lengthwise striate; flowers closely placed on the rachis but not glomerate, sessile, about 3/16 inch long at anthesis and petals narrow; calyx shallowly notched, some or all the five parts often ending in a very short more or less callous point but commonly appearing as if obtuse, not conspicuous until the blossom is dried; fruit oblate, very dark brown and shiny when ripe, 10/16 inch (15 mm.) across and about 7/16 (9-11 mm.) high and with only a short tapering base if any, but varying in size to 8/16 inches across and in shape to short-pyriform.

176. LONG SPADIX of *Sabal umbraculifera* in Santo Domingo; about 3 feet long; branches pulled down and cluster narrowed by weight of fruit.

Widely distributed in Santo Domingo and Haiti, often as scattered trees and frequently constituting the dominant feature in a landscape; in some districts planted for hat-making material. I have not observed native trees in Cuba or other islands that I can refer to this species.

In describing *Sabal umbraculifera* Martius does not disclose the source of his material. The pictures appear to have been made from dried specimens. Beccari's *neglecta* was based on specimens in the herbarium in Berlin collected somewhere in Santo Domingo in 1827 by Jacquemont. *S. domingensis* was founded on specimens collected at Gurabo near Santiago and at Moca in an adjoining province; I have collected Sabal at both these places and Figs.

175, 176 are from the latter place. (Right hand tree in Fig. 174 is leaning but it has straightened itself at the top). *S. haitensis* was described from specimens collected near Gonaives in northern Haiti by W. Buch, a resident of that Republic. In 1937 Mr. Buch directed me to the place where the material was taken and gave me seeds from his collection; I found the palm in March at Poteau, then in flower and fruit; in August 1939 I visited the main tree again and obtained fruit. Dr. Max Burret of Berlin-Dahlem has supplied me with photographs of type or authentic specimens of the three species, and with fruit material of *S. haitensis;* and I have photograph of the type of *S. domingensis* (*Eggers 1678*) in the pictures taken by the Field Museum.

The Hispaniolan palmetto is a commanding object when it has reached full dimensions. One frequently sees it near habitations, towering far above them, the head beyond access. The leaves are important in thatching and in the making of household articles and hats. Often the trees are extensively cropped for the leaves.

The name *Sabal umbraculifera* is widely employed by horticulturists; perhaps we may now be able to determine whether it is correctly applied.

Martius cites *Sabal Blackburnia* (*Blackburniana*), Glazebrook, 1829, as a synonym of *S. umbraculifera*. If the two species are the same, then *S. Blackburnia* must hold as the older name under the genus Sabal. If we accept the Hispaniolan palmetto as *S. umbraculifera* then *S. Blackburnia* is clearly different as judged by the original picture of its fruit. I hope to clarify *S. Blackburnia* when I come again to the monography of the palmettoes.

ARTICLE 22. THE PSEUDOPHOENIX PUZZLE.

In his long-continued search for the trees of North America, Charles Sprague Sargent discovered a palm on the Florida Keys that proved to be new to science. "On the 19th of April, 1886," writes Sargent in Garden and Forest, 1888, "in company with Mr. C. E. Faxon, Mr. A. H. Curtiss, and Lieut. Hubbard, of the United States Navy, I landed from the Lighthouse Tender 'Laurel' near the eastern end of Elliott's Key, one of the larger of the Florida Reef Keys, at the house and Pineapple plantation of Mr. Henry Filer. Our attention was at once directed to a solitary plant of a small pinnate-leaved Palm, left standing in the clearing, which, at first sight, was mistaken for an *Oreodoxa*, but the large orange-scarlet fruit at once showed that we had stumbled upon a tree unknown before in the North American Flora, and quite unlike any of the species of Palms known to us. Specimens of the fruit, which was not, unfortunately, fully ripe, were sent to Dr. Wendland, of Hanover, who provisionally pronounced our Palm to be the representative of a new genus, for which he proposed the name of *Pseudophoenix*." The name *Pseudophoenix Sargentii* was published from Wendland's letter in Botanical Gazette for November 1886. The year following the discovery, 1887, Curtiss published an account of the new palm in Florida Farmer and Fruit Grower (February 23) under the name *Chamæphoenix Sargentii*, an inadvertence. It is a front-page article that gives a detailed account of the discovery, and a picture made from a drawing "which was prepared after photographs secured on Elliott's Key." History of the palm appears also in Sargent's Silva, 1896, volume x.

177. TREE of *Pseudophœnix vinifera*. From Martius.

The palm, under the stimulus of Sargent's activity, promptly received attention in America and Europe. First full technical account was in Garden and Forest in 1888, with Latin diagnosis, from ripe material collected by Curtiss in 1887, and picture from a native grove on Long Key which Sargent visited in 1887. This picture and a popular article were published in Revue Horticole, Paris, in 1888. Technical and popular presentation appeared in Gardeners' Chronicle in 1888, with a woodcut of the Long Key grove. It is entered in Engler and Prantl, Die Natürlichen Pflanzenfamilien, 1889, as a new genus. In 1889 Sprenger published a popular article in the Italian journal, Bulletino della Società R. Toscana di Orticultura, and proposed the name *Sargentia aricocca*.

The Sargent palm was subsequently found on various islands of the Bahama group, and from a study of some of this material collected by John and Alice Northrop, O. F. Cook proposed the genus and species *Cyclospathe Northropi*. It has now been recognized on Cuba and Hispaniola.

Flowers of Pseudophoenix were at first unknown to Sargent, even as late as his Manual of the Trees of North America, 1905. O. F. Cook worked out the flower and fruit morphology, with pictures, in Contributions from the United States National Herbarium, xvi, part 8, 1913.

Thus far we have dealt with *Pseudophoenix Sargentii*. We may now go back to

178. Two young trees of *Pseudophœnix vinifera;* hills of Barahona, Santo Domingo.

the ubiquitous Plumier. He left description and a drawing of a palm known to him on Hispaniola, much employed by the native hunters or *bucaneeri* as a source of beverage or wine. Martius in Munich took up the Plumier account and named the palm *Euterpe? vinifera*, reproducing a picture from Plumier to show the odd morphology of the bole; this picture, reproduced in Fig. 177, clearly identifies the species.

179. FRUIT-CLUSTER of *Pseudophœnix vinifera*, hung in a gateway for photographing; about 6½ feet long. Barahona, Santo Domingo.

In 1912 Beccari published on the palms of Cuba, based on the collections of Charles F. Baker, oddly enough in the Pomona College Journal of Economic Botany: Baker had become connected with that California college. Beccari interpreted the accounts of Plumier and Martius to represent a Pseudophoenix, and he made the binomial *P. vinifera*. This palm, Beccari observes, "was really in past times found in Haiti . . . but has not been as yet found again by modern botanists." He considered it to be quite distinct from *P. Sargentii*. Britton and Millspaugh, however, in the Bahama Flora, 1920, referred *P. Sargentii* to *P. vinifera*, the two palms thought to be identical; Sargent accepted this disposition in the second edition of his Manual of the Trees of North America, 1922, and so the subject

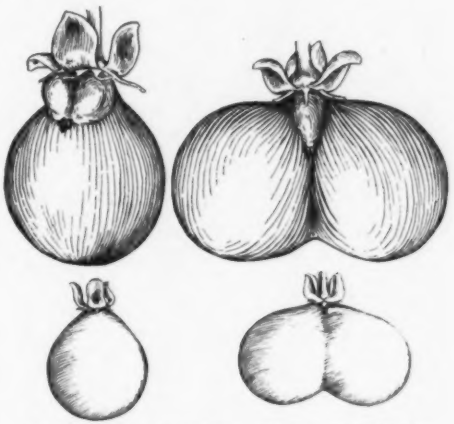
remains until this day among American botanists although Burret ten years ago kept them separate but without stating the differences; he worked on the Ekman material from Cuba and Hispaniola. Cook had collected on Hispaniola and published on Pseudophoenix in 1923, and kept *P. Sargentii* separate. It yet remains, however, to present a unified review of the genus and a key to the species.

The palm *Pseudophoenix vinifera* is widespread and frequent in both Haiti and Santo Domingo, in contrast to the supposition of Beccari. It is a big palm, produces heavy fruit-clusters sometimes 6 feet and more long, and does not lend itself readily to the usual methods of collectors; probably, also, the tree has been mistaken for the royal palm, Roystonea, which the species superficially resembles.

The two species, *P. vinifera* and *P. Sargentii*, are widely distinct. Many years ago I collected *P. Sargentii* on Elliott and Long Keys, in company with John K. Small. On the latter island the native grove was then a striking feature, but Small writes (Manual of the Southeastern Flora, 1933) that the colony of several hundred trees has been destroyed and the trees sold as royal palms. I have taken it also in the Bahamas and Cuba, and have had access to other material. In two collecting journeys on Hispaniola I have collected *P. vinifera;* contrasts may now be drawn.

It is not yet possible to evaluate *P. Ekmanii* and *P. navassana* definitely inasmuch as mature fruits are not described. *P. gracilis* is at once distinguished by its slender almost flexile habit. A good readable account of Pseudophoenix as known in 1922 is by John K. Small in Journal of the New York Botanical Garden, xxiii, 33-43, and separately printed, entitled The Bucaneer Palm; he supposed the Sargent and bucaneer palms to be the same, and adopted the name *vinifera* for the combined species. A much earlier treatment is by N. L. Britton in North American Trees, 1908.

PSEUDOPHOENIX, Wendl. in Bot. Gaz. xi, 314 (1886); Gard. & For. i, 352 (1888). CHERRY PALMS.



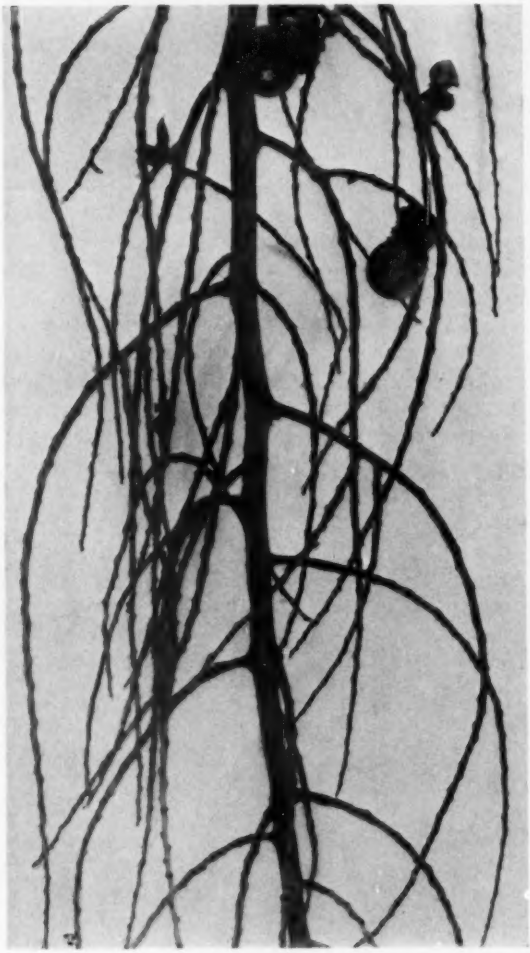
180. FRUITS OF CHERRY PALMS, natural size. *Pseudophœnix vinifera* above; *P. Sargentii* beneath.

Chamæphoenix, A. H. Curtiss, in Florida Farmer & Fruit Grower, Feb. 23, 1887.

Sargentia, Wendl. ex Sprenger, in Bull. Soc. Tosc. Ort., xiv, 341 (1889).

Cyclospathe, Cook, in Mem. Torr. Bot. Club, xii, 24 (1902).

Arboreous, unarmed, single-stemmed, trunk annulate, pinnate-leaved, spadices interfoliar and pendulous and much branched, flowers bisexual and unisexual in same inflorescence: pinnæ 2 or 3 together on the rachis, which is arching or downward-curved: flowers slender-pedicelled, scattered on rachillæ and not immersed, bisexual with 6 dilated stamens and 3-lobed style or some of them staminate and bearing a pistillodium; calyx represented by an obscure rim; petals 3, valvate, obtuse and thickish, persisting in fruit like a calyx as also the pointed broad filaments inside them: fruit drupaceous with thin external pulp, globular to somewhat pyriform, size of cherry or small plum, vivid in shades of red or orange-red, smooth, pedicelled, petals durable and wide-spreading or reflexed along the pedicel, drupe simple or 2-lobed or rarely 3-lobed (depending on how many carpels are fertile), the neck or base bearing scars



181. FRAMEWORK OF THE FRUIT-CLUSTER of *Pseudophœnix vinifera*.

of carpels that fail, and above them the thickened remains of style showing near base or between the lobes when fruit is double or triple; seed globular, plain, smooth, hilum at base, albumen hard and plain (not ruminate).

Section I. PERLONGATÆ. Fruit-cluster (spadix) long and narrow, nearly equalling or exceeding the leaves, conspicuously pendent, twice or thrice as long as broad: ultimate branches or rachillæ mostly 8 cm. or more long and extending in the same general direction as the axis of the cluster: fruit 25-30 mm. long when fresh, 20 mm. broad when simple, with a marked pyriform neck, persistent petals reflexed against the pedicel; seed 15 mm. or more in diameter: pinnæ strongly many-costate on upper surface, loosely placed on the rachis: tree tall and erect, prominently swollen at middle or above and produced into a bottle-like neck at top, the long leaves gracefully drooping like those of *Roystonea regia* or *R. hispaniolana*. .....1. *P. vinifera*

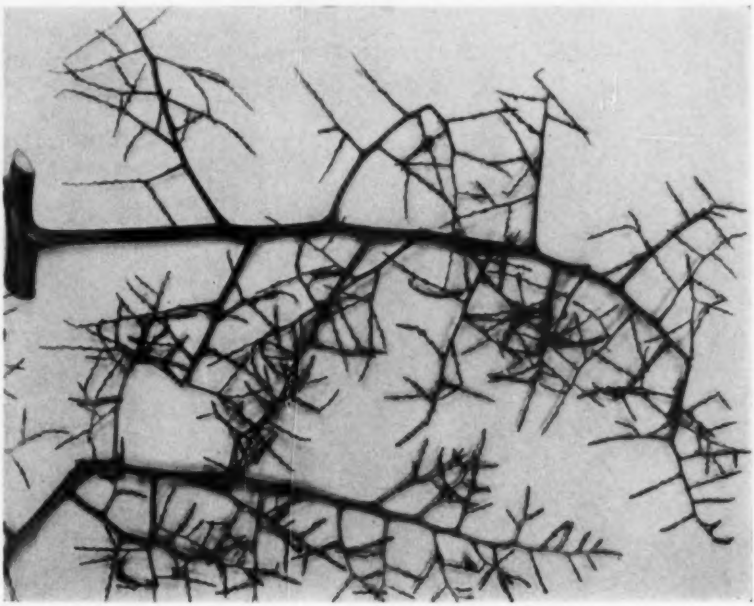
Section II. DIVARICATÆ. Fruit-cluster nearly or quite as broad as long, about one-half or less as long as in I, much shorter than the leaves: ultimate branches or rachillæ short and prominently divaricate.

A. Petals plain or nearly so, not prominently costate (at least not on both surfaces).

B. Pedicels 4 mm. or less long with petals reflexed against them: fruit about 15 mm. long and broad when fresh (of course broader when lobed or multiple); seed about 8 mm. in diameter: pinnæ not conspicuously costate on upper surface, closely placed on rachis: tree low, the trunk irregularly thickened but not bottle-topped, at length usually bent or leaning, the leaves spreading or arching but hardly drooping .2. *P. Sargentii*

BB. Pedicels 6-8 mm. long: petals very large, 7 mm. when dry, not appressed on pedicel (of young fruit): trunk 20 cm. in diameter at base .3. *P. Ekmanii*

BBB. Pedicels 6-7 mm. long: petals about 6 mm. long in fruit, retrorse: trunk very slender, 10 cm. diameter.....4. *P. gracilis*



182. FRAMEWORK OF THE CLUSTER of *Pseudophœnix Sargentii*.

aa. Petals prominently costate on both surfaces: pedicels 5 mm. long: leaves glaucous above.....5. *P. navassana*

1. **Pseudophoenix vinifera,** Becc. in Palms of Cuba (Pomona Coll. Journ. Econ. Bot. ii, no. 2, 268) (1912). GREAT CHERRY PALM. BUCANEER PALM. PALMA GUINEA. Figs. 177, 178, 179, 180, 181.

Euterpe ? vinifera, Martius, Hist. Nat. Palm. i, 85, t. Z2 figs. 18, 19 (1845).

Cocos vinifera, Martius, l. c. t Z3 figs. 18, 19.

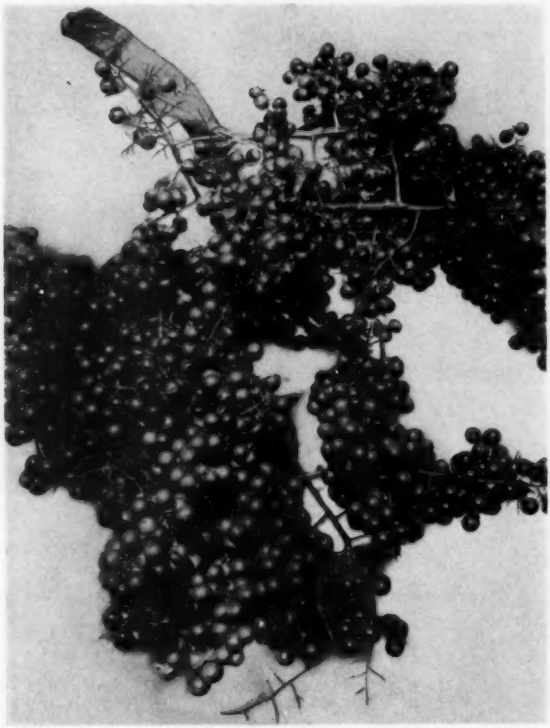
Gaussia vinifera, Wendl. in Kerchove, Palm. 245 (1878).

Aeria vinifera, Cook, in Journ. Wash. Acad. Sci. xiii, 399 (1923).

Pseudophoenix insignis, Cook, l. c. 400, fig. 1.

P. linearis, Cook, l. c. 407.

P. elata, Cook ex Burret, in Kungl. Svensk. Vetens. Akad. Handl. ser. iii, vi, 21 (1929).



183. THE BROAD DIVARICATE FRUIT-CLUSTER of *Pseudophœnix Sargentii*.

Hills and mountain slopes, Hispaniola, in both Haiti and Santo Domingo, on dry land. As I commonly see it, a thin-topped tree 7-9 m. tall but natives report it as reaching the stature of the royal palm. The pinnæ are stiff, with white lines above when fresh and bluish underneath. This year I took a fruit-cluster 2 m. long (Fig. 179), but have seen them about one-half that length. The fruits are bright cherry-red and attractive although covered with a thin waxy bloom; natives use them to feed hogs.

184. Two trees of *Pseudophœnix Sargentii* on Long Key, Florida, 1925.

2. **Pseudophoenix Sargentii,** Wendl. in Bot. Gaz. xi, 314 (1886); Gard. & For. i, 352, figs. 55, 56 (1888). SARGENT CHERRY PALM. Figs. 180, 182, 183, 184.

Cyclospathe Northropi, Cook, in Mem. Torr. Bot. Club, xii, 25 (1902).

Florida Keys (Sands, Elliott, Long Keys, Upper Metacumbe Key), Bahamas, Cuba and Hispaniola, near the sea; distribution not understood in the Greater Antilles. Slow-growing palm to 8 m. tall but commonly less even at bearing age, with irregular usually bent trunk thickened but not ventricose at base or toward middle, sometimes when crowded making a rather slender bole. The fruit-clusters are declined from the axils but hardly pendent, 1 m. or less long and nearly as broad, laterally branched; fruit orange-scarlet.

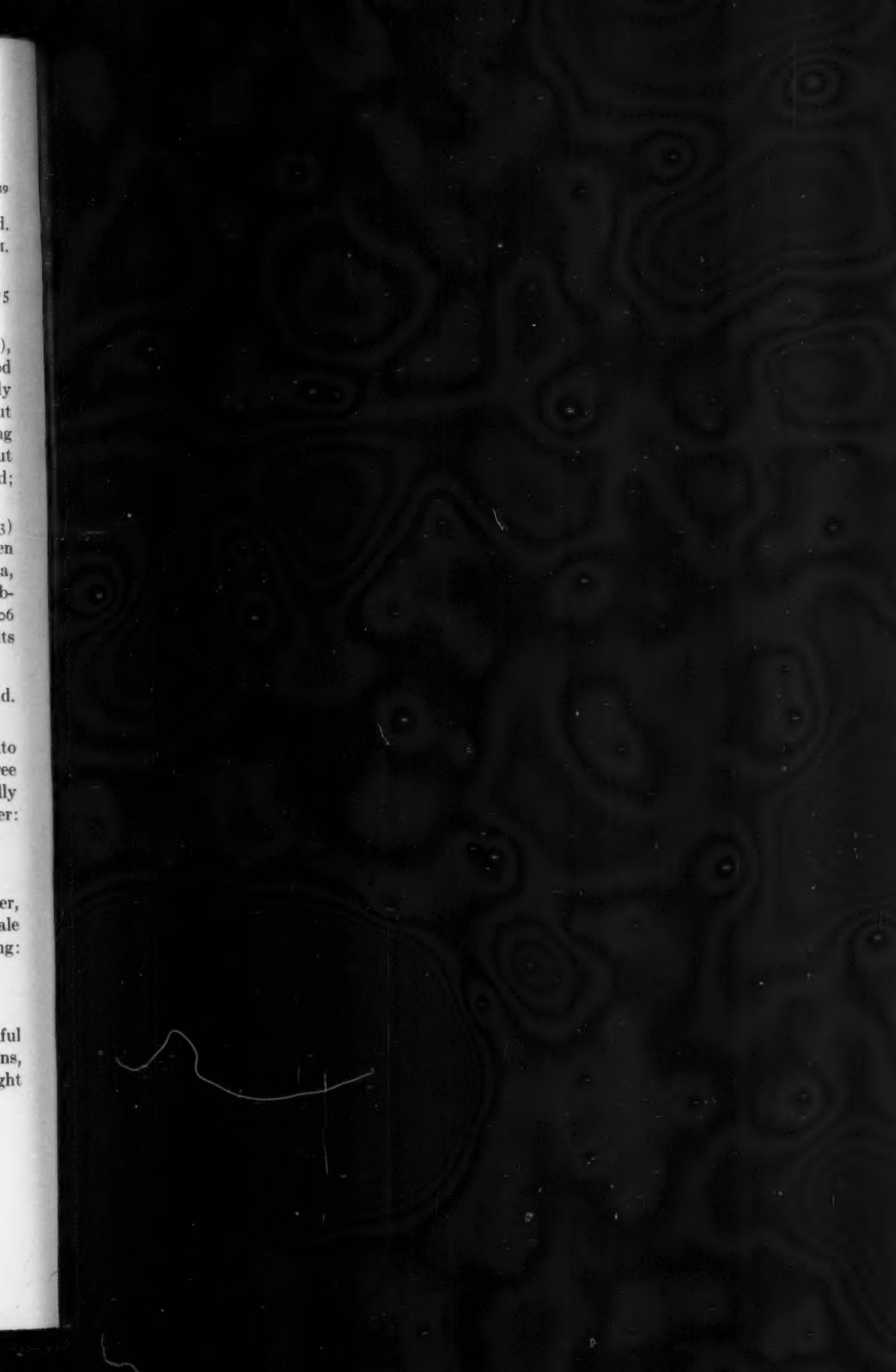
Pseudophoenix saonæ, Cook (Journ. Wash. Acad. Sci. xiii, 416, 1923) is supposed by Burret to be referable to *P. Sargentii.* The type specimen is not sufficient to determine this point. It is from the island of Saona, Santo Domingo. Picture of a tree on Saona said to be this species is published by David Fairchild in National Geographic Magazine, lxvi, 706 (1934). Young plants from it are now growing in southern Florida, and its identity should be established in a few years.

3. **Pseudophoenix Ekmanii,** Burret, in Kungl. Svensk. Vetens. Akad. Handl. ser. iii, vi, 19, t. 3 (1929).

On savanna Petit-Glacis, southern part of Province Barahona, Santo Domingo, in dry calcareous region; known only from *Ekman 7055.* Tree noted by Ekman as 4-5 m. tall, 20 cm. in diameter at base, gradually ventricose to 80 cm. diameter and then contracted to 15 cm. diameter: spadix pendulous, about 80 cm. long, very floriferous, the flowers green.

4. **Pseudophoenix gracilis,** Ekman ex Burret, l. c. 28.

La Gonave, large island in the Gulf of Haiti. Stem erect but very slender, 5-6 m. tall and 10 cm. diameter: pinnæ taking different directions, pale green above and waxy white underneath: pedicels about 6 or 7 mm. long: fruit red when fresh, never lobed, about 16-18 mm. long.

5. **Pseudophoenix navassana,** Ekman ex Burret, l. c. 27.

Island of Navassa, between Jamaica and Haiti. Described as a beautiful palm 5-6 m. tall, with slender stem, pinnæ standing in different directions, leaves pale glaucous above and yellowish-white underneath: flowers bright yellowish-green; pedicels about 5 mm. long.